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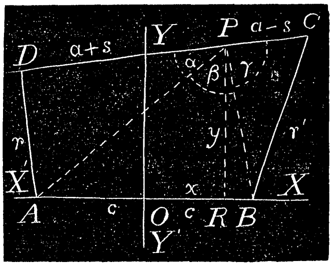
$$\cos\beta = \frac{y^2 + (c+x)^2 + y^2 + (c-x)^2 - 4c^2}{2\sqrt{[y^2 + (c+x)^2]}\sqrt{[y^2 + (c-x)^2]}} = \frac{y^2 + x^2 - c^2}{\sqrt{[y^2+(c+x)^2]}\sqrt{[y^2+(c-x)^2]}} \quad \ldots\ldots (2)$$

$$\cos\gamma = \frac{y^2 + (c-x)^2 + (a-s)^2 - r'^2}{2(a-s)\sqrt{[y^2 + (c-x)^2]}} \ldots\ldots\ldots (3)$$

Now since $\alpha + \beta + \gamma = 180°$, we have

$$2\cos\alpha\cos\beta\cos\gamma + \cos^2\alpha + \cos^2\beta + \cos^2\gamma - 1 = 0. \ldots\ldots (4)$$



Substituting in (4) the values of $\cos\alpha$, $\cos\beta$, and $\cos\gamma$, as given in (1), (2) and (3), we get: $2(a^2 - s^2)(y^2 + x^2 - c^2)[y^2 + (c + x)^2 + (a + s)^2 - r^2][y^2 + (c - x)^2 + (a - s)^2 - r'^2] + (a - s)^2[y^2 + (c - x)^2][y^2 + (c + x)^2 + (a + s)^2 - r^2]^2 + (a + s)^2[y^2 + (c + x)^2][y^2 + (c - x)^2 + (a - s)^2 - r'^2]^2 + 4(a^2 - s^2)^2(y^2 + x^2 - c^2)^2 - 4(a^2 - s^2)^2[y^2 + (c + x)^2][y^2 + (c - x)^2] = 0$. By a laborious reduction we finally obtain:

$$4a^2(x^2 + y^2)^3 - 8acsx(x^2 + y^2)^2 + 4[2a^2(a^2 - s^2) + c^2(2a^2 + s^2) - ar^2(a - s) - ar'^2(a + s)](x^2 + y^2)^2 - 16a^2c^2x^2(x^2 + y^2) + 4[(a^2 - s^2)(r^2 - r'^2 - 4as) - 4asc^2]cx(x^2 + y^2) + 16asc^3x^3 + \{[2a(a^2 - s^2) - r^2(a - s) - r'^2(a + s)]^2 - 4c^2[2(a^2 - s^2)^2 + r^2(a - s)^2 + r'^2(a + s)^2 - (a^2 + 2s^2)c^2]\}(x^2 + y^2) + 8c^2[r^2(a - s)^2 + r'^2(a + s)^2 - 2s^2c^2]x^2 + 2c[2(a^2 - s^2)(r^2 - r'^2)(a^2 - s^2 - c^2) - r^4(a - s)^2 + r'^4(a + s)^2 - 4as(a^2 - s^2 - c^2)^2]x + c^2[r^2(a - s) - r'^2(a + s) - 2s(a^2 - s^2 - c^2)]^2 = 0,$$

which is the equation of the locus of *any* point in the line DC.

When P is the *middle* point, we have merely to make $s = 0$ in our equation, giving:

$$4(x^2 + y^2)^3 + 4(2a^2 - 2c^2 - r^2 - r'^2)x^4 + 4(2a^2 + 2c^2 - r^2 - r'^2)y^4 + 8(2a^2 - r^2 - r'^2)x^2y^2 + 4c(r^2 - r'^2)x(x^2 + y^2) + (2a^2 - 2c^2 - r^2 - r'^2)^2x^2 + [(2a^2 + 2c^2 - r^2 - r'^2)^2 - 16a^2c^2]y^2 + 2c(2a^2 - 2c^2 - r^2 - r'^2)(r^2 - r'^2)x + c^2(r^2 - r'^2)^2 = 0.$$

The terms in the last equation are arranged somewhat differently, in order to show the symmetry of the coefficients.

[The solution of this problem as published in No. 1, p. 28, contains an error in reduction in the equation given in line 3 on said page, which vitiates all the subsequent part of the solution and consequently the conclusion.]

Remark. — Though we dissent from some of the conclusions arrived at by Mr. Adcock in the following solution of 89, yet as Mr. Siverly himself has come to the conclusion that the published solution is defective, we publish Mr. Adcock's solution, hopingthat it will elicit a fuller discussion.–Ed.